ABSTRACT

An apparatus and method for data processing particularly useful in combining convolutions of the spreading code, scrambling code and channel response in order to construct a system transmission coefficient matrix, while maintaining the same circuit size and execution time relative to performing each convolution separately. One register for processing real channel response values and a second register for processing imaginary channel response values, are used for moving channel responses through the convolution. In place of multipliers, an optimized minimum number of adders connected in a pyramid configuration are used to perform the necessary multiplication of the codes, for simplicity of construction. By including the channel code transformation from binary representation to complex representation as part of the overall method, unnecessary adders are eliminated from the apparatus.